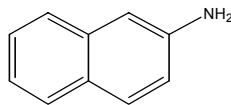


## 2-NAPHTHYLAMINE

CAS No. 91-59-8

First Listed in the *First Annual Report on Carcinogens*



### CARCINOGENICITY

2-Naphthylamine is *known to be a human carcinogen* based on sufficient evidence of carcinogenicity in humans (IARC S.1, 1979; IARC S.4, 1982; IARC S.7; 1987). Epidemiological studies have shown that occupational exposure to 2-naphthylamine, either alone or when present as an impurity in other compounds, is associated causally with bladder cancer in workers

An IARC Working Group reported that there is sufficient evidence of carcinogenicity of 2-naphthylamine in experimental animals (IARC S.1, 1979; IARC S.4, 1982; IARC S.7; 1987). When administered orally, by gavage or in the diet, 2-naphthylamine induced urinary bladder carcinomas in hamsters, dogs, nonhuman primates, and mice (IARC S.1, 1979; IARC V.4, 1974).

### PROPERTIES

2-Naphthylamine occurs as colorless crystals which darken in air to a purple-red color. It is soluble in hot water, alcohol, and many organic solvents. When heated to decomposition, it emits toxic fumes of nitrogen oxides (NO<sub>x</sub>) and explosive vapors.

### USE

2-Naphthylamine, an industrial chemical, is now used for research purposes only. Previously, 2-naphthylamine was used mainly as an intermediate in the manufacture of dyes and as an antioxidant in the rubber industry, but in recent years manufacturers have substituted other chemicals for 2-naphthylamine (IARC V.4, 1974).

### PRODUCTION

2-Naphthylamine is not produced for commercial use in the United States (HSDB, 1997). Chemyclopedia 98 and the 1998 Chemical Buyers Directory do not identify any suppliers of the chemical (Rodnan, 1997; Tilton, 1997). In 1990 one distributor of 2-naphthylamine was identified by Chem Sources (1991). The 1979 TSCA Inventory identified one importer of 2-naphthylamine in 1977, with no volume reported. The CBI Aggregate was less than 1 million lb (TSCA 1979). According to CPSC, a company that reported 2-naphthylamine to the TSCA Inventory in 1979 withdrew its report in 1980; CPSC and EPA stated that notice of this withdrawal was published in the Federal Register in 1981. U.S. companies have neither produced nor imported this compound since January 1975. In 1967, U.S. imports of 2-naphthylamine amounted to 38,000 lb. Previously, U.S. companies commercially produced substantial amounts of the compound for nearly 50 years (IARC V.4, 1974).

## EXPOSURE

The primary routes of potential human exposure to 2-naphthylamine are inhalation, ingestion, and dermal contact. Prior to termination of its domestic production and use in the dye and rubber industries, an estimated 1,000 workers were possibly exposed to 2-naphthylamine. The National Occupational Exposure Survey (1981-1983) indicated that 275 total workers, including 265 women, potentially were exposed to 2-naphthylamine in the work place (NIOSH, 1984). A study correlating the concentration of polycyclic aromatic hydrocarbons (PAHs) in personal air samples of Danish iron foundry workers to levels of 2-naphthylamine in the urine of exposed workers found significantly increased levels of 2-naphthylamine, with the highest levels in hand molders, finishing workers, and truck drivers. The measurements seem to indicate process-related exposure to nitronaphthalene, suggesting the use of urinary 2-naphthylamine as a biomarker in assessing PAH exposure in foundry workers (Hansen et al., 1994).

Human exposure will be mainly to emissions from sources where nitrogen-containing organic matter is pyrolyzed, such as coal furnaces and cigarettes (HSDB, 1997). Investigators have found a level of 0.02 µg/cigarette in the latter (IARC V.4, 1974). The compound also occurs as an impurity in commercial 1-naphthylamine (0.5% or less). Laboratory technicians and scientists who use the compound in research may constitute the group with the greatest risk of potential exposure.

## REGULATIONS

EPA regulates 2-naphthylamine under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), and Superfund Amendments and Reauthorization Act (SARA). Under CERCLA, EPA established a reportable quantity (RQ) of 10 lb for 2-naphthylamine. Under RCRA, EPA regulates 2-naphthylamine as a constituent of hazardous waste, and under SARA, established threshold quantities for releases of 2-naphthylamine. The FDA regulates 2-naphthylamine for use in adhesives in various food products under the Federal Food, Drug and Cosmetic Act (FD&CA). NIOSH recommends the lowest feasible concentration for 2-naphthylamine as the exposure limit. The OSHA standard for 2-naphthylamine includes requirements for protective clothing, engineering controls, and medical surveillance. OSHA regulates 2-naphthylamine under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table A-31.